
Option 61C upgrade to Option 81C with Fiber Network

Content list

The following are the topics in this section:

- Reference list 129
- Overview of Option 61C to Option 81C with Fiber Network Fabric upgrade 130
- Prepare for upgrade 130
- Add Network Group 1 132
- Complete upgrade preparation tasks 137
- Perform the upgrade 147
- Complete the upgrade 171

Reference list

The following are the references in this section:

- “Prepare for upgrade” on page 47
- “Connect a terminal” on page 54
- “Back out of a system software upgrade” on page 79
- “Check 3PE settings” on page 50
- “Pre-route cables” on page 58
- *X11 Administration* (553-3001-311)
- *X11 Maintenance* (553-3001-511)

Overview of Option 61C to Option 81C with Fiber Network Fabric upgrade

An Option 61C system with NT5D21 Core/Net modules can be upgraded to an Option 81C system with Fiber Network Fabric. This upgrade takes a 61C to an Option 81C with two (2) groups. Once the upgrade procedure is completed, additional groups may be added to the Option 81C by following the procedure to “Add a Network Group” on page 177.

To upgrade an Option 61C to an Option 81C with Fiber Network Fabric:

- A new column is installed next to the existing Option 61C column with the Core/Net modules.
- The new column contains one IPE module and two Network modules.
- The two new Network modules provide the new system with a minimum of two full Network groups.
- The existing Clock Controllers are moved from the Core/Net modules to the Network shelves.
- New cards for Fiber Network Fabric are added: NTRB33 Fiber Junctor Interface (FIJI) card and the NTRE39 Optical Cable Management Card (OCMC).
- An additional IPE module may be installed on the top of the new column.

Figure 23 shows the upgrade from Option 61C to Option 81C with Fiber Network Fabric.

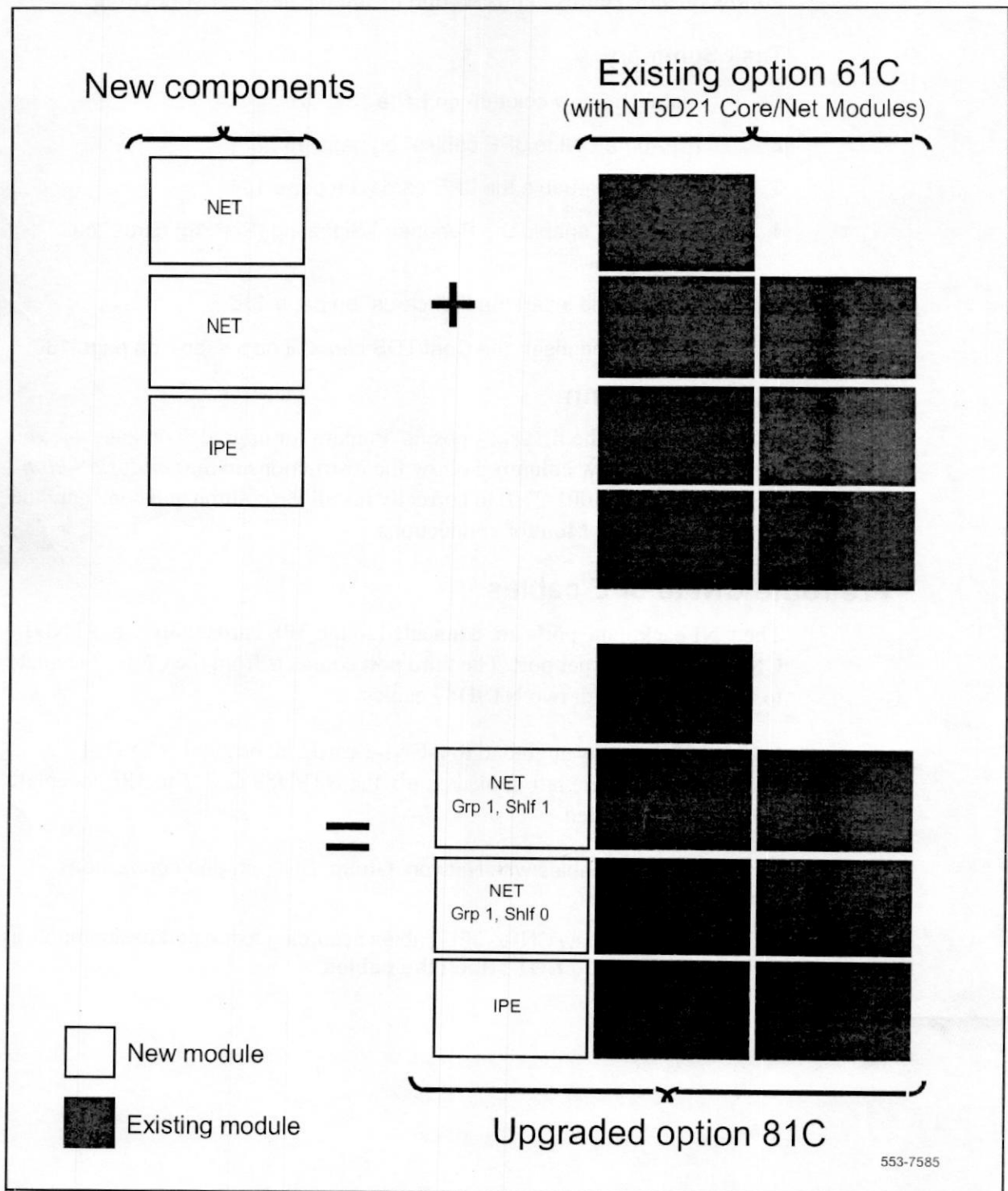
Prepare for upgrade

Complete the first six tasks defined in the “Prepare for upgrade” section on page 47. These tasks include:

- Check power supply version (DC power only)
- Check minimum system requirements
- Check 3PE settings
- Prepare to move the Clock Controllers
- Connect a terminal
- Print site data

Figure 23

Upgrade from Option 61C to Option 81C with Fiber Network Fabric



Add Network Group 1

Follow the procedures in this section to add the new Network Group 1.

Task Summary

- 1 "Install the new column" on page 132.
- 2 "Pre-route CNI to 3PE cables" on page 132.
- 3 "Install and enable the 3PE cards" on page 134.
- 4 "Install and enable the Peripheral Signaling (Per Sig) cards" on page 136.
- 5 "Disable and insert the FIJI cards" on page 136.
- 6 "Disable and insert the Conf/TDS cards, if necessary" on page 136.

Install the new column

After completing the first six steps in "Prepare for upgrade" on page 47, you must install the new column. Follow the instructions in *System Installation Procedures* (553-3001-210) to correctly install the column and configure the power and System Monitor connections.

Pre-route CNI to 3PE cables

The CNI backplane ports are connected to the 3PE cards with two NTND14 CNI to 3PE cables per port. The third port connects from the CNI-3 faceplate to the 3PE card with two NT9D89 cables.

When a CNI card is upgraded to a CNI-3 card, the original NTND14 backplane cables are left in place; only the NT9D89 CNI-3 to 3PE faceplate cables must be added.

- 1 Label the cables with Network Group, CNI port and connection information.
- 2 Route the new CNI to 3PE cables according to the port assignments in Table 18. **Do NOT attach the cables.**

Table 18
Option 81C CNI group assignments

Group	CNI slot connections	3PE faceplate connection	Cable
1	12D (Core/Net backplane)	J3	NTND14
1	12F (Core/Net backplane)	J4	NTND14
2	12 J1 (CNI-3 faceplate)	J3	NT9D89
2	12 J2 (CNI-3 faceplate)	J4	NT9D89
3	13A (Core/Net backplane)	J3	NTND14
3	13C (Core/Net backplane)	J4	NTND14
4	13D (Core/Net backplane)	J3	NTND14
4	13F (Core/Net backplane)	J4	NTND14
5	13 J1 (CNI-3 faceplate)	J3	NT9D89
5	13 J2 (CNI-3 faceplate)	J4	NT9D89
6	14A (Core/Net backplane)	J3	NTND14
6	14C (Core/Net backplane)	J4	NTND14
7	14D (Core/Net backplane)	J3	NTND14
7	14F (Core/Net backplane)	J4	NTND14
Note 1: Group 0 is hard-wired through the Core/Net module backplane; no cable is required. Note 2: The default assignments in this table can be reconfigured with Overlay 17 (LD 17) if necessary.			

Install and enable the 3PE cards

Three steps are required to install the 3PE cards:

1 Verify the 3PE card settings:

The group and shelf number of each Network module is determined by the switch settings on the 3PE card. Use the information in Table 19 to verify that the 3PE cards in the new Network modules have the correct switch and jumper settings.

This group and shelf setting is displayed on the FIJI card display.

2 Install a 3PE card in slot 1 of each new Network module. Push the latches forward to lock the card in place.

3 Faceplate *enable* each 3PE card.

Table 19

Switch and jumper settings for 3PE cards in NT8D35 Network modules

Jumper Settings									
Set Jumper RN27 at E35 to "A".									
Switch Settings									
D20 switch position:		1	2	3	4				
81, 81C (Note)		off	on	on	on				
Shelf	Group	D20 switch position:				5	6	7	8
0 (3PE cards connected to the a CNI in Core or Core/Net 0)	0					on	on	on	on
	1					on	on	off	on
	2					on	off	on	on
	3					on	off	off	on
	4					off	on	on	on
	5					off	on	off	on
	6					off	off	on	on
	7					off	off	off	on
1 (3PE cards connected to the a CNI in Core or Core/Net 1)	0					on	on	on	off
	1					on	on	off	off
	2					on	off	on	off
	3					on	off	off	off
	4					off	on	on	off
	5					off	on	off	off
	6					off	off	on	off
	7					off	off	off	off

Note: For option 81C systems, QPC441 vintage F or later must be used in all modules.

Install and enable the Peripheral Signaling (Per Sig) cards

- 1 Install a Per Sig card into slot 4 of each new Network module. Push the latches forward to lock the card in place.
- 2 Faceplate *enable* the cards.

Disable and insert the FIJI cards

- 1 Faceplate *disable* the FIJI cards.
- 2 Insert the FIJI cards into slots 2 and 3 of each new Network module.
DO NOT plug the card into the backplane.

Disable and insert the Conf/TDS cards, if necessary

If Conf/TDS cards are used in the system, follow the procedures below.

- 1 Faceplate *disable* the Conf/TDS cards.
- 2 Insert a Conf/TDS card into each new Network module.
DO NOT plug the card into the backplane.

Complete upgrade preparation tasks

Follow the procedures in this section to complete the remaining upgrade preparation tasks.

Task Summary

- 1 "Complete upgrade preparation tasks" on page 137.
- 2 "Route the FIJI Fiber Ring cables" on page 138.
- 3 "Route the Clock Controller to FIJI cables" on page 142.
- 4 "Perform a template audit" on page 144.
- 5 "Backup the database" on page 145.

Pre-route cables

To minimize system downtime during the upgrade, all cables should be routed before the upgrade is begun.

Review the information in "System architecture" on page 31 to determine how the cables will be routed for your system. Use the information below to plan the exact path and placement of each cable.

CAUTION

Be careful not to dislodge existing cables when routing new cables.

- 1 Label all cables at both ends.
- 2 Remove all module trim panels where cables will be routed.
- 3 Do not excessively bend or cinch the Fiber Ring cables. These cables are easily damaged. Use the Optical Cable Management Card (OCMC) to manage and protect the Fiber Ring cables. See page 40 for a description of this card.
- 4 Route all cables based on the descriptions and diagrams in "System architecture" on page 31.

Route the FIJI Fiber Ring cables

The Dual Ring Fiber Network is comprised of two separate Rings of NTRC48 fiber optic cable: one Ring between the FIJI cards in all Network shelf 0's and a second Ring between the FIJI cards in all Network shelf 1's.

Carefully route the NTRC48 cables before installation. Always label both ends of each cable to simplify installation, reduce confusion and assist in troubleshooting.

Route the shelf 0 fiber optic cables (ascending)

Route the NTRC48 cables between the FIJI cards in each Network shelf 0 in *ascending* order (Table 20):

Note: Each end of the NTRC48xx cable is labeled "Tx" or Rx" in the factory.

- 1 Start with group 0, shelf 0.
- 2 Route a NTRC48xx FIJI Fiber Ring cable of the appropriate length from the FIJI card in **Group 0, shelf 0** to the FIJI card in **Group 1, shelf 0**.
- 3 To complete the Ring, route a final cable from **Group 1, shelf 0** back to **Group 0, shelf 0**.

Table 20
FIJI Ring 0 connections

Groups X - 0 are cabled in ascending order		
Group/shelf	NTRC48 fiber cable connector	FIJI card connector
0/0	P1	Tx - J1
1/0	P2	Rx - J2
1/0	P1	Tx - J1
2/0	P2	Rx - J2
2/0	P1	Tx - J1
3/0	P2	Rx - J2
3/0	P1	Tx - J1
4/0	P2	Rx - J2
4/0	P1	Tx - J1
5/0	P2	Rx - J2
5/0	P1	Tx - J1
6/0	P2	Rx - J2
6/0	P1	Tx - J1
7/0	P2	Rx - J2
7/0	P1	Tx - J1
0/0	P2	Rx - J2
Note: Groups 2 through 7 are shown for reference only.		

Route the shelf 1 fiber optic cables (descending)

Route the NTRC48 cables between the FIJI cards in each Network shelf 1 in *descending* order (Table 21).

Note: Each end of the NTRC48xx cable is labeled “Tx” or Rx” in the factory.

- 1 Start with the Tx (J1) port in group 0, shelf 1.
- 2 Route a NTRC48xx FIJI Fiber Ring cable of the appropriate length from the FIJI card in **Group 0, shelf 1** to the FIJI card in **Group 1, shelf 1**.
- 3 To complete the Ring, route a final cable from **Group 1, shelf 1** to **Group 0, shelf 1**.

Table 21
FIJI Ring 1 connections

Groups 0 - X are cabled in descending order		
Group/shelf	NTRC48 fiber cable connector	FIJI card connector
0/1	P1	Tx - J1
7/1	P2	Rx - J2
7/1	P1	Tx - J1
6/1	P2	Rx - J2
6/1	P1	Tx - J1
5/1	P2	Rx - J2
5/1	P1	Tx - J1
4/1	P2	Rx - J2
4/1	P1	Tx - J1
3/1	P2	Rx - J2
3/1	P1	Tx - J1
2/1	P2	Rx - J2
2/1	P1	Tx - J1
1/1	P2	Rx - J2
1/1	P1	Tx - J1
0/1	P2	Rx - J2
Note: Groups 2 through 7 are shown for reference only.		

Route the Clock Controller to FIJI cables

Clock to FIJI (NTRC46) cables must be in place before the upgrade (Figure 24). **Do not connect the cables to the FIJI cards or Clock Controller cards. Route the cables only.** The cables are not connected until the actual upgrade is performed.

Route the Clock 0 to FIJI cables (FIJI end)

- 1 From Clock 0: Route the **P1** end of the Clock to FIJI cable (NTRC46Ax) to **Group 0, shelf 0**.

Do not connect the cable to the FIJI card.

- 2 From Clock 0: Route the **P2** end of the Clock to FIJI cable (NTRC46Ax) to **Group 0, shelf 1**.

Do not connect the cable to the FIJI card.

Route the Clock 1 to FIJI cables (FIJI end)

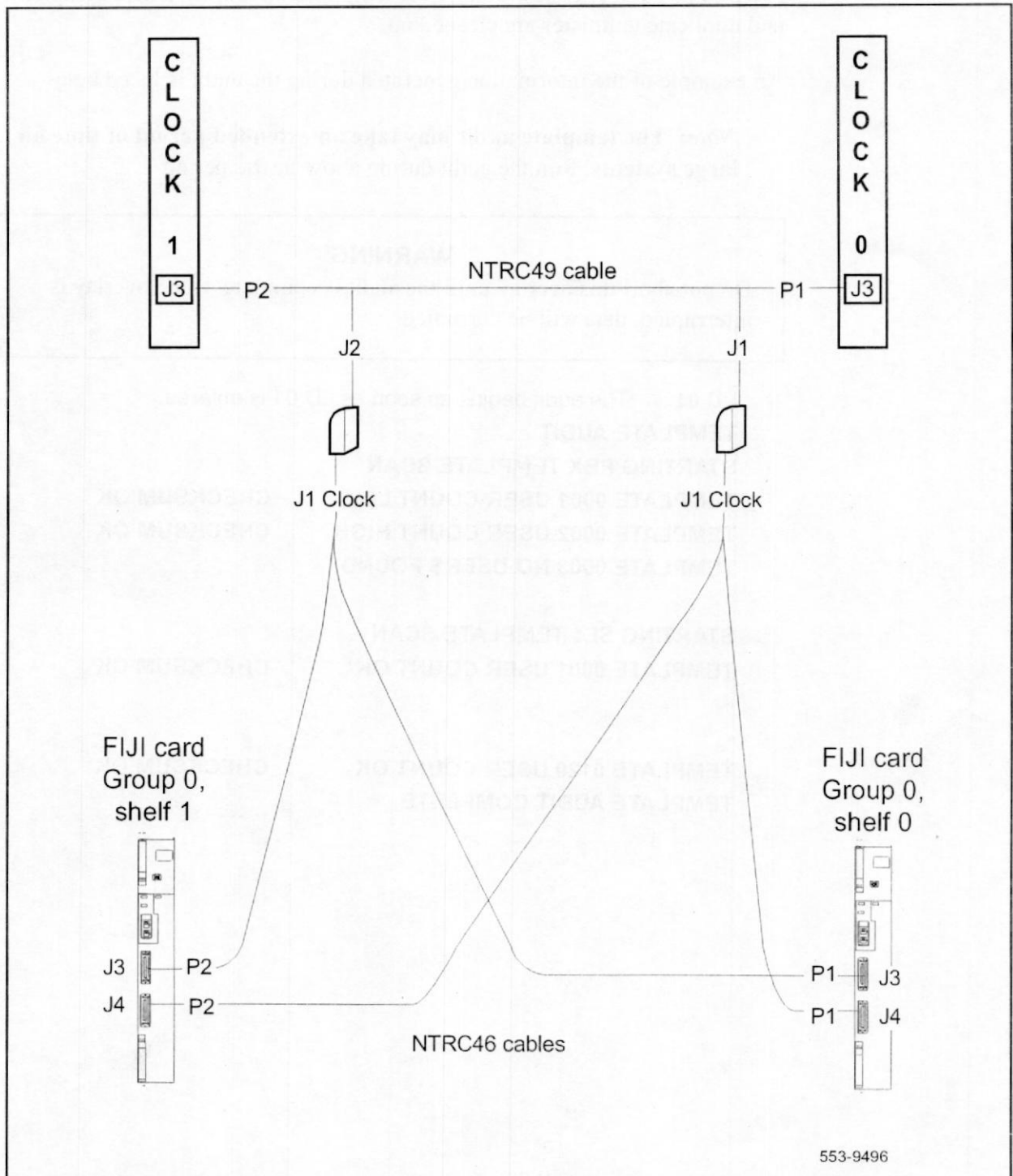
- 1 From Clock 1: Route the **P1** end of the Clock to FIJI cable (NTRC46Ax) to **Group 0, shelf 0**.

Do not connect the cable to the FIJI card.

- 2 From Clock 1: Route the **P2** end of the Clock to FIJI cable (NTRC46Ax) to **Group 0, shelf 1**.

Do not connect the cable to the FIJI card.

Figure 24
Clock Controller cable configuration



Perform a template audit

A template audit (LD 01) reviews the templates in your system. Corrupted and duplicate templates are cleaned up.

An example of the information generated during the audit is listed below.

Note: The template audit may take an extended period of time on large systems. Run the audit during a low traffic period.

WARNING

Do not abort this overlay until the audit is complete. If the overlay is interrupted, data will be corrupted.

LD 01 The audit begins as soon as LD 01 is entered.

TEMPLATE AUDIT

STARTING PBX TEMPLATE SCAN

TEMPLATE 0001 USER COUNT LOW	CHECKSUM OK
TEMPLATE 0002 USER COUNT HIGH	CHECKSUM OK
TEMPLATE 0003 NO USERS FOUND	

STARTING SL1 TEMPLATE SCAN

TEMPLATE 0001 USER COUNT OK	CHECKSUM OK
-----------------------------	-------------

•
•

TEMPLATE 0120 USER COUNT OK	CHECKSUM OK
TEMPLATE AUDIT COMPLETE	

Backup the database

To back up the data on the system, complete the two part procedure described below:

- Perform a **data dump** to save all system memory to the hard disk.
- Perform a **BKO (unattended backup)** to save the database to a spare set of floppy disks.

Perform a data dump

- 1 Log into the system.
- 2 Load the Equipment Data Dump Program (LD 43). At the prompt, enter **LD 43** to load the program
- 3 When "EDD000" appears on the terminal, enter **EDD** to begin the data dump
- 4 The messages "DATADUMP COMPLETE" and "DATABASE BACKUP COMPLETE" will appear once the data dump is complete
**** to exit the program

CAUTION

If the data dump is not successful, do not continue; contact your technical support organization. A data dump problem must be corrected before the system is upgraded to Fiber Network.

Perform a BKO (save the database to floppies)

- 1 Insert floppy diskettes into BOTH floppy disk drives in each Core or Core/Net IODU/C.

Note: If the file is too large to fit on a single floppy disk, the BKO command will compress the data. If the compressed data is still too large to fit on a single disk, both floppy disks in the two IODU/C drives will be used. Be sure to insert floppy disks into BOTH IODU/C drives before the BKO backup is begun.

- 2 Run the BKO backup (LD 43):
 BKO to run the backup
- 3 If the backup is successful, a message will state that the database backup is complete. A report will also indicate which floppy drives were used by the procedure.
- 4 If there are validation errors, repeat the procedure.

CAUTION

If the backup is not successful, do not continue; contact your technical support organization. Any backup problems must be corrected before the system is upgraded to Fiber Network.

- 5 Once the backup is complete, type:
 **** to exit the program

Perform the upgrade

To complete the Option 61C to Option 81C with Fiber Network Fabric upgrade, follow the procedures listed below in sequence.

Task summary

- 1 "Verify Core/Net 0 is active" on page 148.
- 2 "Split the Core/Nets" on page 148.
- 3 "Upgrade the Core/Net 1 software" on page 149.
- 4 "Enable the Core 1 CNI cards" on page 153.
- 5 "Enable new loops in Group 1" on page 154.
- 6 "Upgrade Side 1 hardware to FIJI" on page 154.
- 7 "Connect the shelf 1 FIJI Ring cables" on page 155.
- 8 "Turn module power off" on page 157.
- 9 "Seat the Side 1 FIJI cards" on page 157.
- 10 "Seat the Side 0 FIJI cards" on page 157.
- 11 "Connect the shelf 0 FIJI Ring cables" on page 158.
- 12 "Connect the Group 1 FIJI to FIJI cables" on page 160.
- 13 "Move Clock Controller 0" on page 160.
- 14 "Move Clock Controller 1" on page 161.
- 15 "Cable the Clock Controllers" on page 163.
- 16 "Prepare Core cards for power-up" on page 165.
- 17 "Restore power" on page 165.
- 18 "Verify the Fiber Rings" on page 166.
- 19 "Enable the Peripheral Signaling (Per Sig) card" on page 167.
- 20 "Enable the Conference/TDS card" on page 167.
- 21 "Upgrade Core/Net 0 software" on page 168.
- 22 "Enable the Core 0 CNI cards" on page 170.

Verify Core/Net 0 is active

- 1 Get the status of the CPUs. Verify that all common equipment is enabled.

LD 135 to load the program

STAT CPU to get the status of both Core/Nets

- 2 Ensure Core/Net 0 is active.

If Core/Net 1 is active, switch Core/Nets.

STAT CPU to get the status of the Core/Nets

SCPU to switch to Core/Net 0

******** to exit the program

- 3 Ensure Clock Controller 0 is active and tracking.

LD 60 to load the program

SSCK 0 to get the status of Clock 0

SSCK 1 to get the status of Clock 1

SWCK if necessary, to switch to Clock 0

Split the Core/Nets

- 1 Be sure Core/Net 0 is active and Core/Net 1 is standby. You may need to switch Cores:

STAT CPU

******** exit program

- 2 Verify that IODU/C 0 is active. You may need to switch IODU/Cs.

LD 137

STAT Get the status of IODU/C

SWAP Switch IODU/Cs if necessary

******** exit program

- 3 Connect a terminal to the CPSI port in Core/Net 1 to J25 of the I/O panel at the back of the Core/Net. Be sure it is configured as follows. The recommended baud rate is 9600, to be the same as the CPSI port.

7 data bits, 1 stop bit, Space parity, Full duplex, XON protocol

- 4 Place Core/Net 0 in Maintenance by setting the MAINT/NORM switch to MAINT.
- 5 In Core/Net 1, disable the NT6D65 Core to Network Interface (CNI) cards by setting the ENB/DIS faceplate switches to DIS.

Upgrade the Core/Net 1 software

Core/Net 1 must be *inactive* to complete these procedures. A terminal must be connected to the J25 connector on Core/Net 1 to complete this procedure. See "Connect a terminal" on page 54.

Complete the steps below to install new software in Core/Net 1.

- 1 Place the CP Install disk that corresponds with the installed CP card type into the IODU/C in Core/Net 1.
- 2 Install the CD-ROM into the CD drive:
 - a press the button on the CD-ROM drive to open the CD-ROM disk holder
 - b place the CD-ROM disk into the holder with the disk label showing
 - c use the four tabs to secure the CD-ROM drive
 - d press the button again to close the CD-ROM disk holder (don't push the holder in by hand)
- 3 In Core/Net 1, perform the following three steps in uninterrupted sequence:
 - a press and hold the MAN RST button on the CP card
 - b set the MAINT/NORM switch on the CP card to MAINT
 - c release the MAN RST button

A sysload will begin (cold start). Wait for the Main Menu to appear on the terminal before proceeding.

Note 1: If the CD-ROM is not in the CD drive of the IODU/C, the installation procedure will not continue. Insert the CD-ROM into the drive to continue.

Note 2: If a problem is detected during the system verification, Install stops, prints an error message, and aborts the installation. If the verification is not successful, do not continue; contact your technical support organization.

- 4 Press <CR> to continue.
- 5 Remove the CP Install Program diskette and insert the Keycode diskette, when prompted.
 - <a> to continue with keycode validation
 - <y> to confirm that the keycode matches the CD-ROM release
- 6 When the Install Menu is displayed, select the following options in sequence when you are prompted to do so
 - <a> to install software, CP-BOOT ROM, and IOP-ROM
 - <a> to verify that the CD-ROM is now in drive

The Installation Status Summary screen appears that lists the options to be installed.

 - <y> Yes, start Installation
 - <a> Continue with Upgrade

- 7** Select a PSDL file to install. The PSDL file contains the loadware for all downloadable cards in the system and loadware for M3900 series sets.

Select one of the six psdl files

- <1> Global 10 Languages <default>
- <2> Western Europe 10 Languages
- <3> Eastern Europe 10 Languages
- <4> North America 6 Languages
- <5> Rls24 up-issue
- <6> North America 6 Languages:

The languages contained in each selection are outlined as follows:

- 1 English, French, German, Spanish, Swedish, Italian, Norwegian, Brazilian, Portuguese, Finnish, Japanese Katakana.
- 2 English, French, German, Spanish, Swedish, Norwegian, Danish, Finnish, Italian, Brazilian Portuguese.
- 3 English, French, German, Dutch, Polish, Czech, Hungarian, Russian, Latvian, Turkish.
- 4 English, Spanish, French, Brazilian Portuguese, Japanese Katakana, German.
- 5 English, French, German, Spanish, Swedish, Italian, Norwegian, Portuguese, Finnish, Japanese Katakana.
- 6 English, French, German, Spanish, Brazilian Portuguese, Japanese Katakana.

- 8 When the ROM installation screen appears, select the following prompts in sequence:

<a> Continue with ROM Upgrade

The following message appears:

Software Release XXXX was installed successfully on Core 1.
All files were copied from CDROM to the hard disk.

Please press <CR> to continue when ready...

<a> Continue with ROM upgrade

<a> Yes, start Installation

<a> Continue with ROM upgrade

When the Installation Status Summary screen appears, press
<CR> when ready...

<cr> Are you sure you want to continue with IOP ROM

<a> to install the IOP-ROM from hard disk

<y> Yes, start installation

<a> to continue with ROM upgrade

The Installation Status Summary screen appears. Verify that CD
to disk, disk to ROM, CP-BOOTROM, and IOP-ROM were
installed.

<cr> press return to continue

<q> to quit (remove any diskettes from the floppy drive)

<y> Yes, to confirm quit

<a> to reboot the system

The system will automatically perform a sysload during which
several messages will appear on the system terminal. Wait for
"DONE" and then "INI" messages to be displayed before
continuing.

Software installation on Core/Net 1 is complete.

Note: If the system fails to load, or system messages indicate data
corruption, back out of the parallel reload process by performing the
steps in "Back out of a system software upgrade" on page 79.

Enable the Core 1 CNI cards

Follow these procedures to connect and activate the Core 1 CNI ports.

Note: CNI cards can be enabled and connected on the *inactive* Core only.

- 1 Verify that the cables are correctly routed and labeled. See "Pre-route CNI to 3PE cables" on page 132.
- 2 Attach the cables to the *inactive* 3PE faceplates.
- 3 Attach the cables to the *inactive* CNI cards.

See Table 18, "Option 81C CNI group assignments," on page 133 for connection information.

WARNING

The backplane connector pins are easily bent. Install backplane cables with extreme caution to ensure that these pins are not damaged.

- Carefully line up the cable and press it into place.
- Never force a cable into the slot. If the cable gets stuck, remove it and try again. Damage to the backplane connector pins can make installation of CNI cables impossible.

- 4 Add CNI group:
LD 17 to load the program.
CNI s p g (*slot port group*) to add a CNI group.
- 5 Software enable the *new* CNI port on the *inactive* Core:.
LD 135 to load the program.
ENL CNI c s p (*core slot port*) to enable the card and ports.

Enable new loops in Group 1

- 1 Define the loops in the new group:

For example:

```
LD 17            to load the program
REQ             CHG
TYPE            CEQU
....
XCT             xxx (enter the new loop)
                 xxx
....
```

- 2 Enable the new loops.

```
LD 34            to load the program
ENLX            to enable the newly defined loop
****            to exit the program
```

Upgrade Side 1 hardware to FIJI

Follow the procedures below in sequence:

- 1 Software disable the IGS/DIGS cards in Side 1 (IGS/DIGS odd-numbered cards, 1 - 19):

```
LD 39            to load the program
DISI IGS xx    xx is the IGS card number 1 - 19
```

Note: See the *X11 Maintenance* (553-3001-511) for more information on overlay 39 commands.

- 2 Faceplate disable the IGS/DIGS cards in Side 1.
- 3 Tag and disconnect the IGS/DIGS cables.
- 4 Remove the IGS/DIGS cards from Side 1.

Note: If you did not check the 3PE switch settings before, check the 3PE switch settings now. See "Check 3PE settings" on page 50.

- 5 Faceplate enable the FIJI cards.

- 6 Insert the FIJI cards in Side 1. **DO NOT seat the FIJI cards.**

Note: FIJI cards are installed in slots 2 and 3 of the Network modules, and slots 8 and 9 of the Core/Net modules.

Connect the shelf 1 FIJI Ring cables

To create the shelf 1 fiber optic loop, connect the FIJI cards in each Network shelf 1 in **descending** order, from Tx to Rx (Table 22).

Remove the black cap from the end of each cable before it is connected.

Note: Each end of the NTRC48 cable is labeled "Tx" or Rx" in the factory.

- a Start with Network Group 0, shelf 1.
- b Connect a NTRC48 FIJI Fiber Ring cable of the appropriate length from the Tx (J1) port of the FIJI card in **Group 0, shelf 1** to the Rx (J2) port of the FIJI card in **Group, shelf 1**.
- c To complete the Ring, connect a final cable from Tx in **Group 1, shelf 1** to Rx in **Group 0, shelf 1**.

Note: Connect the Side 1 FIJI Ring cables only.

Table 22
FIJI Ring 1 connections

Groups 0 - X are cabled in descending order		
Group/shelf	NTRC48 fiber cable connector	FIJI card connector
0/1	P1	Tx - J1
7/1	P2	Rx - J2
7/1	P1	Tx - J1
6/1	P2	Rx - J2
6/1	P1	Tx - J1
5/1	P2	Rx - J2
5/1	P1	Tx - J1
4/1	P2	Rx - J2
4/1	P1	Tx - J1
3/1	P2	Rx - J2
3/1	P1	Tx - J1
2/1	P2	Rx - J2
2/1	P1	Tx - J1
1/1	P2	Rx - J2
1/1	P1	Tx - J1
0/1	P2	Rx - J2
Note: Groups 2 through 7 are shown for reference only.		

Turn module power off

WARNING

Call processing will be interrupted for approximately 30 minutes while the procedures are completed.

To reduce downtime, verify that all cables are pre-routed. See “Complete upgrade preparation tasks” on page 137.

Power down the modules with the module power switch. DO NOT power down the columns at the PDU:

- 1 Power down Core/Net Module 0.
- 2 Power down Core/Net Module 1.
- 3 Power down all Network Modules.

Seat the Side 1 FIJI cards

The FIJI cards in side 1 can now be seated.

- 1 Push the faceplate latches forward to lock the cards in place.
- 2 Verify that the cards are faceplate *enabled*.

Seat the Side 0 FIJI cards

- 1 Tag and disconnect the IGS/DIGS cables.
- 2 Remove the IGS/DIGS cards from Side 0.
- 3 Insert and seat the FIJI cards in Side 0.
- 4 Faceplate enable the FIJI cards.

Connect the shelf 0 FIJI Ring cables

To create the shelf 0 fiber optic Ring 0, connect the FIJI cards in each Network shelf 0 in **ascending** order, from Tx to Rx ports (Table 23).

Remove the black cap from the end of each cable before it is connected.

Note: Each end of the NTRC48 cable is labeled “Tx” or Rx” in the factory.

- a Start with Group 0, shelf 0.
- b Connect a NTRC48 FIJI Fiber Ring cable of the appropriate length from the Tx (J1) port of the FIJI card in **Group 0, shelf 0** to the Rx (J2) port of the FIJI card in **Group 1, shelf 0**.
- c To complete the Ring, connect a final cable from the Tx (J1) port in **Group 1, shelf 0** back to the Rx (J2) port in **Group 0, shelf 0**.

Table 23
FIJI Ring 0 connections

Groups X - 0 are cabled in ascending order		
Group/shelf	NTRC48 fiber cable connector	FIJI card connector
0/0	P1	Tx - J1
1/0	P2	Rx - J2
1/0	P1	Tx - J1
2/0	P2	Rx - J2
2/0	P1	Tx - J1
3/0	P2	Rx - J2
3/0	P1	Tx - J1
4/0	P2	Rx - J2
4/0	P1	Tx - J1
5/0	P2	Rx - J2
5/0	P1	Tx - J1
6/0	P2	Rx - J2
6/0	P1	Tx - J1
7/0	P2	Rx - J2
7/0	P1	Tx - J1
0/0	P2	Rx - J2
Note: Groups 2 through 7 are shown for reference only.		

Connect the Group 1 FIJI to FIJI cables

- 1 Connect P2 of a NTRC47 FIJI to FIJI cable to J4 of the FIJI cards in each Network shelf 0, **except Group 0**.
- 2 Connect P1 of a NTRC47 FIJI to FIJI cable to J4 of the FIJI cards in each Network shelf 1, **except Group 0**.

Note: The FIJI cards in Group 0 do not receive a FIJI to FIJI cable.

Move Clock Controller 0

- 1 Faceplate disable Clock Controller 0.
- 2 Disconnect the cable from the faceplate connector on the Clock Controller card.

Primary and secondary Clock reference cables that are connected to the faceplate should be disconnected next and labeled.

- 3 Remove Clock Controller 0 from the Core/Net module.
- 4 Set the Clock Controller 0 switch settings (see Table 24, "Clock Controller switch settings," on page 162).
- 5 Install Clock Controller 0 in Network Group 1, shelf 0, slot 13.

Note: Clock Controllers may be installed in any Network Group. However, a two-group Option 81C has only two Network Modules. In this case, both Clock Controllers must be installed in Group 1. If in the future the Option 81C is upgraded to more than two Network Groups, Nortel Networks recommends that Clock Controller 0 and 1 be located in different Network Groups.

- 6 Reconnect the Clock 0 Reference cables.
- 7 Faceplate enable the Clock Controller.

Move Clock Controller 1

- 1 Faceplate disable Clock Controller 1.
- 2 Disconnect the cable from the faceplate connector on the Clock Controller card.

Primary and secondary Clock reference cables that are connected to the faceplate should be disconnected next and labeled.

- 3 Remove Clock Controller 1 from the Core/Net module.
- 4 Set the Clock Controller 0 switch settings (see Table 24, "Clock Controller switch settings," on page 162).
- 5 Install Clock Controller 1 in Network Group 1, shelf 1, slot 13.

Note: Clock Controllers may be installed in any Network Group. However, a two-group Option 81C has only two Network Modules. In this case, both Clock Controllers must be installed in Group 1. If in the future the Option 81C is upgraded to more than two Network Groups, Nortel Networks recommends that Clock Controller 0 and 1 be located in different Network Groups.

- 6 Reconnect the Clock 0 Reference cables.
- 7 Faceplate enable the Clock Controller.

Table 24
Clock Controller switch settings

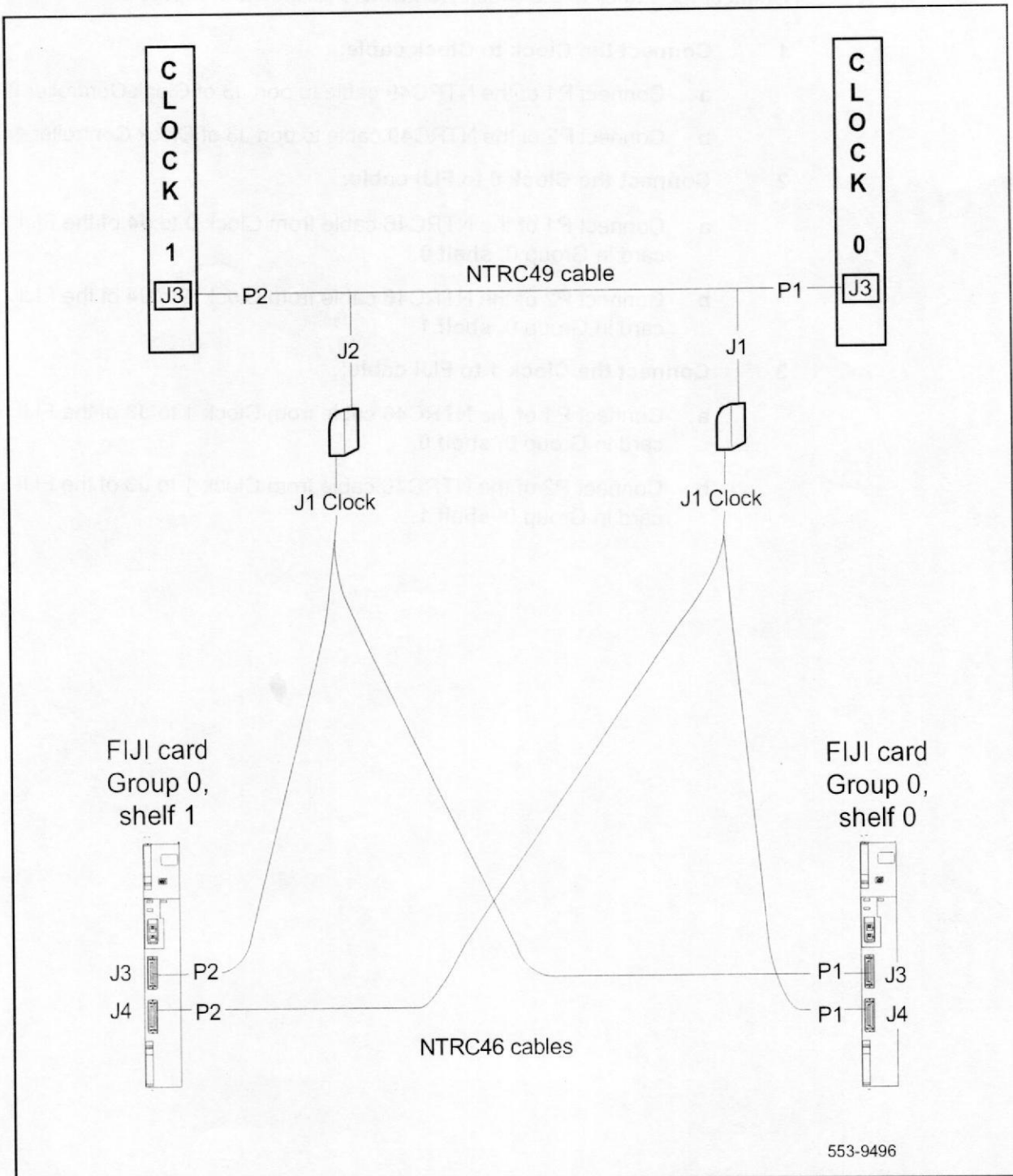
Option 81C switch settings must be used to enable Clock Hunt software. DO NOT use the Option 81 switch settings.											
SW1				SW2				SW4			
1	2	3	4	1	2	3	4	1	2	3	4
on	off	off	off	off	off	off	off	**	on	*	*
*Cable length between the J3 faceplate connectors:											
0–4.3 m (0–14 ft.)										off	off
4.6–6.1 m (15–20 ft.)										off	on
6.4–10.1 m (21–33 ft.)										on	off
10.4–15.2 m (34–50 ft.)										on	on
* If there is only one Clock Controller card in the system, set to OFF. If there are two Clock Controller cards, determine the total cable length between the J3 connectors (no single cable can exceed 25 ft.) and set these two switch positions for this cable length, as shown above. The maximum total (combined) length is 50 ft. Set the switches on both cards to the same settings. ** Set to ON for Clock Controller 0. Set to OFF for Clock Controller 1. Note: For FNF based-systems, the total clock path length is equal to the length of the NTRC49 cable used to connect between the two clock controller cards.											

Cable the Clock Controllers

Connect the cables to the Clock Controllers as shown in Figure 25:

- 1 Connect the Clock to Clock cable:**
 - a** Connect P1 of the NTRC49 cable to port J3 of Clock Controller 0.
 - b** Connect P2 of the NTRC49 cable to port J3 of Clock Controller 1.
- 2 Connect the Clock 0 to FIJI cable:**
 - a** Connect P1 of the NTRC46 cable from Clock 0 to **J4** of the FIJI card in Group 0, **shelf 0**.
 - b** Connect P2 of the NTRC46 cable from Clock 0 to **J4** of the FIJI card in Group 0, **shelf 1**.
- 3 Connect the Clock 1 to FIJI cable:**
 - a** Connect P1 of the NTRC46 cable from Clock 1 to **J3** of the FIJI card in Group 0, **shelf 0**.
 - b** Connect P2 of the NTRC46 cable from Clock 1 to **J3** of the FIJI card in Group 0, **shelf 1**.

Figure 25
Clock Controller cable configuration



Prepare Core cards for power-up

- 1 Verify that a terminal is connected to the J25 I/O panel connector on Core/Net 1. See "Connect a terminal" on page 54.
- 2 Verify that both CP cards in the Core modules are in MAINT position.
- 3 Unseat the CP card in Core/Net 0.
- 4 Faceplate *disable* the CNI cards in Core/NET 0.
- 5 Faceplate *disable* the IODU/C in Core/Net 0.
- 6 Unseat the IODU/C in Core/Net 0.
- 7 Faceplate *enable* the CNI cards in Core/Net 1.

Restore power

Restore power in the order below:

- 1 Restore power to Core/Net 1.
- 2 Restore power to Core/Net 0.
- 3 Restore power to the Network modules.
- 4 Wait for the system to load/init.
- 5 Re-initialize Core/Net 1.

Note: Re-initializing Core/Net 1 stops the midnight routines from running.

Verify the Fiber Rings

See the *X11 Maintenance* (553-3001-511) for more information on Overlay 39 commands. Also see "Appendix A: Fiber Network Fabric Application Notes" on page 207 for additional information on FIJI cards.

- 1 Check that Fiber Ring 1 operates correctly:
 LD 39 to load the program
 STAT RING 1 to check the status of Ring 1
- 2 Reset the Rings:
 RSET to reset the Rings and prepare them for redundancy
 RSTR to restore both Rings to Normal state
- 3 Check that the Rings operate correctly:
 STAT RING 0 to check the status of Ring 0
 STAT RING 1 to check the status of Ring 1
- 4 If any Ring problems occur, correct them now.
 STAT ALRM <X> <Y> to check the alarm status of individual FIJI cards or all FIJI cards. See *X11 Administration* (553-3001-311) for more information.
- 5 Verify that call processing operates correctly: this includes, but is not limited to the following:
 - Check for dial tone.
 - Make internal, external, and network calls.
 - Check attendant console activity.
 - Check DID trunks.
 - Check any auxiliary processors.

Enable the Peripheral Signaling (Per Sig) card

- 1 Enable the Per Sig card in Group 1:
LD 32 to load the program
ENPS x (slot) to enable the Peripheral Signalling card
******** to exit the program

For example:

- | | |
|----------------|-----------------------------|
| ENPS 12 | to enable slot 12 (Group 6) |
| ENPS 13 | to enable slot 13 (Group 6) |

See Table 18, "Option 81C CNI group assignments," on page 133 for slot and Group assignments.

Enable the Conference/TDS card

- 1 Plug in the Conf/TDS card in Group 1. Push the latches forward to lock the card in place.
- 2 Faceplate enable the Conf/TDS cards.
- 3 Enable the Conf/TDS cards:
LD 34 to load the program
ENLX x (loop) to enable the Conf/TDS card
******** to exit the program

Upgrade Core/Net 0 software

- 1 Seat the IODU/C. Verify the status on the display (A1).
- 2 Faceplate enable the IODU/C.
- 3 Insert the CP Install Program diskette into IODU/C floppy drive in Core/Net 0.
- 4 Verify that the CP card in Core/Net 0 is in MAINT mode.
- 5 Seat the CP card.
- 6 Connect a terminal to the J25 port on the I/O panel in Core/Net 0.
- 7 Press the MAN RST button on the CP card in Core/Net 0 to reboot the system and start the Software Installation Tool. (The terminal displays SYSLOAD messages during file loading. When SYSLOAD is completed, the NT logo appears.)
- 8 Initiate the installation by selecting the following prompt from the menu:
 <cr> <u>> to Install menu
- 9 Remove the CP Install Program diskette and insert the Keycode diskette, when prompted.
 <a> continue with keycode validation
- 10 Remove the Keycode diskette and re-insert the CP Install Program diskette into the IODU/C floppy drive in Core/Net/Net 0.
- 11 When the main menu appears, select the following option to copy the software from Core//Net 1 to Core/Net/Net 0 and exit the Main Menu:
 <o> to copy system software from the other Core/Net
- 12 When the software is installed successfully, press <CR> to install CP-software from the hard disk to Flash EEPROM, and install CP-BOOT ROM. Follow the screen directions until the Main Menu returns.

- 13** From the Main Menu, select the prompts in the following sequence to install the IOP-ROM:

<f>	to install IOP-ROM only
<cr> <a>	to install the IOP-ROM from hard disk
<y>	Yes, start installation
<cr> <a>	to continue with ROM upgrade

Follow the screen directions until the Main Menu returns.

- 14** From the Main Menu, select the following options in sequence to copy the customer database from Core/Net/Net 1 to Core/Net/Net 0.:

<d>	to go to the Database menu
<d>	to copy the database from Core/Net 1 to Core/Net 0
<y>	to confirm the installation status summary
<a>	to confirm database copy

- 15** From the Main Menu, select the following options to quit and reload the system:

<q>	to quit
<y>	to confirm quit

- 16** Reboot the Core/Net/Net 0 CPU:

<a>	to reboot the system
-----	----------------------

Wait for "DONE" and then "INI" messages to be displayed before continuing.

Enable the Core 0 CNI cards

Follow these procedures to connect and activate the Core 0 CNI ports.

Note: CNI cards can be enabled and connected on the *inactive* Core only.

- 1 Verify that the cables are correctly routed and labeled. See "Pre-route CNI to 3PE cables" on page 132.
- 2 Attach the cables to the *inactive* 3PE faceplates.
- 3 Attach the cables to the *inactive* CNI cards.

See Table 18, "Option 81C CNI group assignments," on page 133 for connection information.

WARNING

The backplane connector pins are easily bent. Install backplane cables with extreme caution to ensure that these pins are not damaged.

- Carefully line up the cable and press it into place.
- Never force a cable into the slot. If the cable gets stuck, remove it and try again. Damage to the backplane connector pins can make installation of CNI cables impossible.

- 4 Add CNI group:
LD 17 to load the program.
CNI s p g (*slot port group*) to add a CNI group.
- 5 Software enable the *new* CNI port on the *inactive* Core:.
LD 135 to load the program.
ENL CNI c s p (*core slot port*) to enable the card and ports.

Complete the upgrade

Follow the procedures below in sequence to complete the upgrade. If an error occurs at any time, resolve the problem before continuing.

Task Summary

- 1 "Exit split mode" on page 171.
- 2 "Synchronize the hard disks" on page 172.
- 3 "Verify Core/Net redundancy" on page 172.
- 4 "Test Core/Net 1 and Core/Net 0" on page 173.
- 5 "Switch the Clocks" on page 174.
- 6 "Check Fiber Ring status" on page 174.
- 7 "Backup the database" on page 175.

Exit split mode

- 1 Perform the following in uninterrupted sequence:
 - Press and release the MAN RST button in Core/Net 0.
 - When SYS700 messages appears on LCD display on Core/Net 0, set the MAINT/NORM switch to NORM in Core/Net 0.

In 60 seconds, the LCD will display and confirm your processes with:

RUNNING ROM OS

ENTERING CP VOTE

- 2 An HWI534 message indicates the start of memory synchronization. In 10 minutes, an HWI533 message on Core/Net 1 CSPI or SDI terminal indicates the memory synchronization is complete.

Note: The HWI messages are displayed on the TTY device connected to the active core.

- 3 Once the synchronization is complete, enable the CNI cards in Core/Net 0 (set the ENB/DIS faceplate switch to ENB).

- 4 Check the status of the CPU and CNI cards in Core/Net 1:
LD 135
STAT CPU Get status of CPU and memory
STAT CNI Get status of CNI cards
- 5 Enable the CNI ports if necessary:
ENL CNI c s p Enable CNI on *core, slot, port*
- 6 In Core/Net 1, set the MAINT/NORM switch on the CP card to NORM.

Synchronize the hard disks

- 1 Load LD 137 and synchronize the hard disks. Synchronization may take up to seven minutes. To be sure that the contents of IODU/C 1 are copied to IODU/C 0, verify that IODU/C 0 is disabled.
LD 137
STAT Get the status of the IODU/C and redundancy
SYNC Enter "Yes" to synchronize disks. Wait until the memory synchronization successfully completes before continuing.
TEST CMDU Performs hard and floppy disk test.
- 2 Get the status of the IODU/Cs and be sure IODU/C 0 is active. Switch if necessary.
STAT Get the status of IODU/C and redundancy
SWAP Switch CMDU if necessary
STAT CMDU Get the status of the IODU/Cs. Be sure the same IODU/C and CPU are active.
******** exit program

Verify Core/Net redundancy

To verify redundancy, switch the active Cores back and forth to verify that both sides operate without problems.

- LD 135**
- SCPU** to switch the active Core/Net
- SCPU** to switch the active Core/Net again

Test Core/Net 1 and Core/Net 0

- 1 Perform a redundancy sanity test using the following sequence:

LD 135

STAT CNI	Get status of CNI cards
STAT CPU	Get status of CPU and memory
TEST CPU	Test the inactive Core/Net/Net
TEST CNI c s	Test each inactive CNI card

- 2 Switch Core/Nets and test the other side (Core/Net 0)

SCPU	Switch Core/Nets
TEST CPU	Test the inactive Core/Net/Net
TEST CNI c s	Test each inactive CNI card

Note: Testing the CP and CNI cards and synchronizing memory can take up to 20 minutes for each test. When the CP test is complete, the CP the memory is automatically synchronized.

- 3 Clear the display and minor alarms on both Core/Nets.

CDSP	Clear the displays on the Core/Nets
CMAJ	Clear major alarms
CMIN ALL	Clear minor alarms

- 4 Get the status of the Core/Nets, CNIs, and memory.

STAT CPU	Get the status of both Core/Nets
STAT CNI	Get the status of all configured CNIs and memory

Note: You may need to execute the STAT CNI command twice before receiving a response from the system.

**** exit program

Switch the Clocks

- 1 Verify that the clock controller is assigned to the *active* Core.
 LD 60 to lead the program
 SSCK *x* to get the status of the clock controllers (*x* is "0" or
 "1" for Clock 0 or Clock 1.
 SWCK to switch the Clock if necessary
 **** exit program
- 2 Verify that the Clock Controllers are switching correctly:
 SWCK to switch the Clock
 SWCK to switch the Clock again

Check Fiber Ring status

See the *X11 Maintenance* (553-3001-511) for more information on overlay 39 commands. Also see "Appendix A: Fiber Network Fabric Application Notes" on page 207 for additional information on FIJI cards.

- 1 Check that the Fiber Rings operate correctly:
 LD 39 to load the program
 STAT RING 0 to check the status of Ring 0
 STAT RING 1 to check the status of Ring 1
- 2 If necessary, restore the Rings to Normal State:
 RSTR to restore both Rings to Normal state
- 3 Check that the Rings operate correctly:
 STAT RING 0 to check the status of Ring 0
 STAT RING 1 to check the status of Ring 1
- 4 Check the status of the FIJI alarms
 STAT ALRM to query the alarm condition for all FIJI cards in
 all Network Groups

Backup the database

- 1 Log into the system.
- 2 Load the Equipment Data Dump Program (LD 43). At the prompt, enter
LD 43 to load the program
- 3 When "EDD000" appears on the terminal, enter
EDD to begin the data dump
- 4 When "DATADUMP COMPLETE" and "DATABASE BACKUP COMPLETE" appears on the terminal, enter
******** to exit the program

CAUTION

If the data dump is not successful, do not continue; contact your technical support organization. A data dump problem must be corrected before the upgrade is complete.

Add a Network Group

Content list

The following are the topics in this section:

- Reference list 177
- Prepare for installation 179
- Verify removal of 3PE cards from Option 81 Core shelves 179
- Add the new Network modules 180
- Add CNI cards if necessary 180
- Pre-route CNI to 3PE cables 181
- Pre-route the FIJI cables 184
- Install cards in the Network modules 191
- Install and enable the 3PE cards 191
- Install and enable the Peripheral Signaling (Per Sig) cards 193
- Disable and insert the FIJI cards 193
- Disable and insert the Conf/TDS cards, if necessary 193
- Enable the CNI cards 193
- Enable the FIJI cards 194
- Connect the new groups to the Fiber Network 196

Reference list

The following are the references in this section:

- *System Installation Procedures* (553-3001-210)

- “System architecture” on page 31

The procedures in this section are for systems that have already been upgraded to Fiber Network. Follow the procedures in order.

Task summary

- 1 “Prepare for installation” on page 179.
 - a “Verify removal of 3PE cards from Option 81 Core shelves”.
 - b “Add the new Network modules”.
 - c “Add CNI cards if necessary”.
 - d “Pre-route CNI to 3PE cables”.
 - e “Pre-route the FIJI cables”.
- 2 “Install cards in the Network modules” on page 191.
 - a “Install and enable the 3PE cards”.
 - b “Install and enable the Peripheral Signaling (Per Sig) cards”.
 - c “Disable and insert the FIJI cards”.
 - d “Disable and insert the Conf/TDS cards, if necessary”.
- 3 “Enable the CNI cards” on page 193.
- 4 “Enable the FIJI cards” on page 194.
- 5 “Connect the new groups to the Fiber Network” on page 196.

Prepare for installation

Complete these steps before installation of the new Network Groups. Follow the steps in order.

Task summary

- 1 "Verify removal of 3PE cards from Option 81 Core shelves" (below).
- 2 "Add the new Network modules" (below).
- 3 "Add CNI cards if necessary" on page 180.
- 4 "Pre-route CNI to 3PE cables" on page 181.
- 5 "Pre-route the FIJI cables" on page 184.

Verify removal of 3PE cards from Option 81 Core shelves

In Option 81 systems, the 3PE card must be removed from the Core shelves. This card should have been removed during the upgrade procedure (page 94).

If this card was not removed during the upgrade process, remove it now.

Note: This procedure is for Option 81 systems with Core shelves. This procedure is NOT necessary for Option 81C systems with Core/Net shelves.

To remove the 3PE card from both Cores:

- 1 In Core 1, hardware disable the 3PE card.
- 2 In Core 0, hardware disable the 3PE card.
- 3 Remove the 3PE faceplate cable.
- 4 Remove the 3PE cards from Core 1 and 0.

Add the new Network modules

The new Network modules must be connected to the system. Follow the instructions in *System Installation Procedures* (553-3001-210) to correctly configure the power and System Monitor connections.

Add CNI cards if necessary

CNI-3 cards are added only if additional ports are required. CNI-3 cards can only be installed in an *inactive* Core module.

Port assignments

The default port assignments for CNI cards in Option 81 and 81C systems are shown in Table 25 and Table 26. These assignments can be modified in overlay 17 (LD 17) if necessary.

When a two port CNI card is replaced with a three port CNI-3 card, the original port assignments for the backplane connections remain the same.

Install the CNI-3 cards

- 1 On the *inactive* Core, software disable the CNI slots where the new cards will be installed:

LD 135 to load the program.
DIS CNI c s p (*core slot port*) to disable the card and ports.
- 2 Faceplate disable the CNI cards to be replaced on the *inactive* Core.
- 3 Remove the CNI cards to be replaced, if necessary.
- 4 Install the new CNI-3 cards. The CNI-3 cards must be faceplate disabled before installation.
- 5 Faceplate enable all CNI cards on the *inactive* Core.

Add a CNI group

- 1 Add CNI group(s).
LD 17 to load the program.
CNI s p g (*slot port group*) to add a CNI group.
- 2 Software enable the *original* CNI ports on the *inactive* Core. Do NOT activate the CNI ports for the new Network Groups.
LD 135 to load the program.
ENL CNI c s p (*core slot port*) to enable the card and ports.
- 3 Switch active Cores:
SCPU to switch Cores
- 4 Follow steps 2 through 8 to install the CNI cards on the second Core. Be sure to make the second Core *inactive*.
- 5 Verify the status of the CNI cards:
STAT CNI to check the status of the cards and ports.

Pre-route CNI to 3PE cables

The CNI backplane ports are connected to the 3PE cards with two NTND14 CNI to 3PE cables per port. The third port connects from the CNI-3 faceplate to the 3PE card with two NT9D89 cables.

When a CNI card is upgraded to a CNI-3 card, the original NTND14 backplane cables are left in place; only the NT9D89 CNI-3 to 3PE faceplate cables must be added.

- 1 Label the cables with Network Group, CNI port and connection information.
- 2 Route the new CNI to 3PE cables according to the port assignments in Table 25 and Table 26. **Do NOT attach the cables.**

Table 25
Option 81 CNI group assignments

Group	CNI connection	3PE faceplate connection	Cable
5	8A (Core backplane)	J3	NTND14
5	8C (Core backplane)	J4	NTND14
0	8D (Core backplane)	J3	NTND14
0	8F (Core backplane)	J4	NTND14
1	9A (Core backplane)	J3	NTND14
1	9C (Core backplane)	J4	NTND14
2	9D (Core backplane)	J3	NTND14
2	9F (Core backplane)	J4	NTND14
3	10A (Core backplane)	J3	NTND14
3	10C (Core backplane)	J4	NTND14
4	10D (Core backplane)	J3	NTND14
4	10F (Core backplane)	J4	NTND14
6	9 J1 (CNI-3 faceplate)	J3	NT9D89
6	9 J2 (CNI-3 faceplate)	J4	NT9D89
7	10 J1 (CNI-3 faceplate)	J3	NT9D89
7	10 J2 (CNI-3 faceplate)	J4	NT9D89
Note: The default assignments in this table can be reconfigured with Overlay 17 (LD 17) if necessary.			

Table 26
Option 81C CNI group assignments

Group	CNI slot connections	3PE faceplate connection	Cable
1	12D (Core/Net backplane)	J3	NTND14
1	12F (Core/Net backplane)	J4	NTND14
2	12 J1 (CNI-3 faceplate)	J3	NT9D89
2	12 J2 (CNI-3 faceplate)	J4	NT9D89
3	13A (Core/Net backplane)	J3	NTND14
3	13C (Core/Net backplane)	J4	NTND14
4	13D (Core/Net backplane)	J3	NTND14
4	13F (Core/Net backplane)	J4	NTND14
5	13 J1 (CNI-3 faceplate)	J3	NT9D89
5	13 J2 (CNI-3 faceplate)	J4	NT9D89
6	14A (Core/Net backplane)	J3	NTND14
6	14C (Core/Net backplane)	J4	NTND14
7	14D (Core/Net backplane)	J3	NTND14
7	14F (Core/Net backplane)	J4	NTND14
Note 1: Group 0 is hard-wired through the Core/Net module backplane; no cable is required. Note 2: The default assignments in this table can be reconfigured with Overlay 17 (LD 17) if necessary.			

Pre-route the FIJI cables

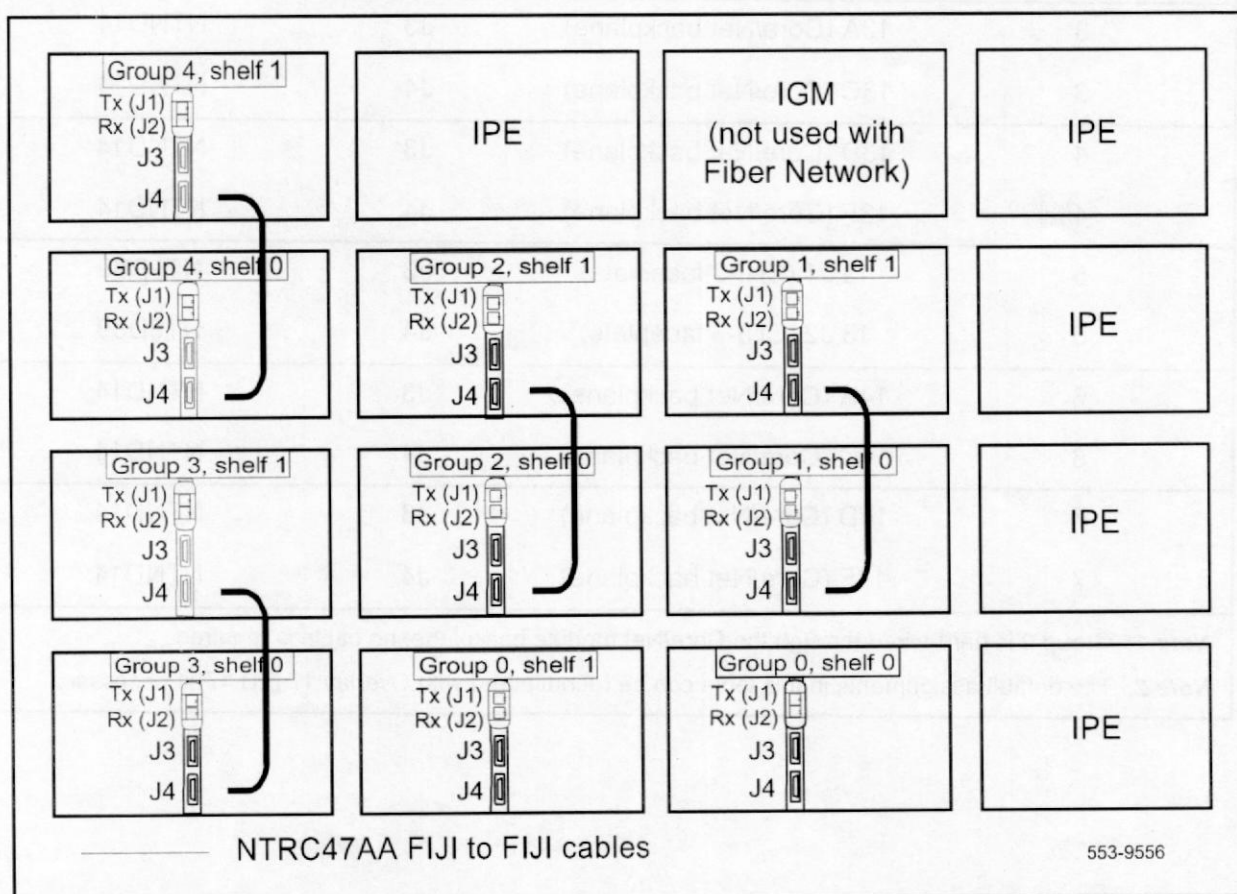
To minimize system downtime during the upgrade, all FIJI cables must be in place before the new Network Groups are added. See "System architecture" on page 31 for an overview of FIJI cable configuration.

Route FIJI to FIJI cables

Route a NTRC47AA cable between the FIJI cards in shelf 0 and shelf 1 of each new Network Group.

Figure 26

Route FIJI to FIJI cables (Option 81C example)



Label and route the shelf 0 fiber optic cables (ascending)

Route the NTRC48 cables between the FIJI cards in each new Network shelf 0 in *ascending* order (Figure 27):

CAUTION

Do not excessively bend or cinch the Fiber Ring cables. These cables are easily damaged. Use the Optical Cable Management Card (OCMC) to manage and protect the Fiber Ring cables. See page 40 for a description of this card.

- 1 Start with shelf 0 in the current highest Network Group.
- 2 Label each cable on both sides with the appropriate connection information from Table 27.
- 3 Route a NTRC48 FIJI Fiber Ring cable of the appropriate length from the FIJI card in **shelf 0 of the current highest Network Group**, to the FIJI card in **shelf 0 of the new Network Group**.
- 4 If more than one Network Group is to be added, route a second NTRC48 cable of the appropriate length to **shelf 0 of the second new group**.
- 5 Continue to route NTRC48 cable of the appropriate length in ***ascending*** order between shelf 0 of each new Network Group.
- 6 To complete the Ring, route a final cable from the **highest number group** back to **Group 0, shelf 0**.

Figure 27
Shelf 0 ascending fiber optic Ring (example)

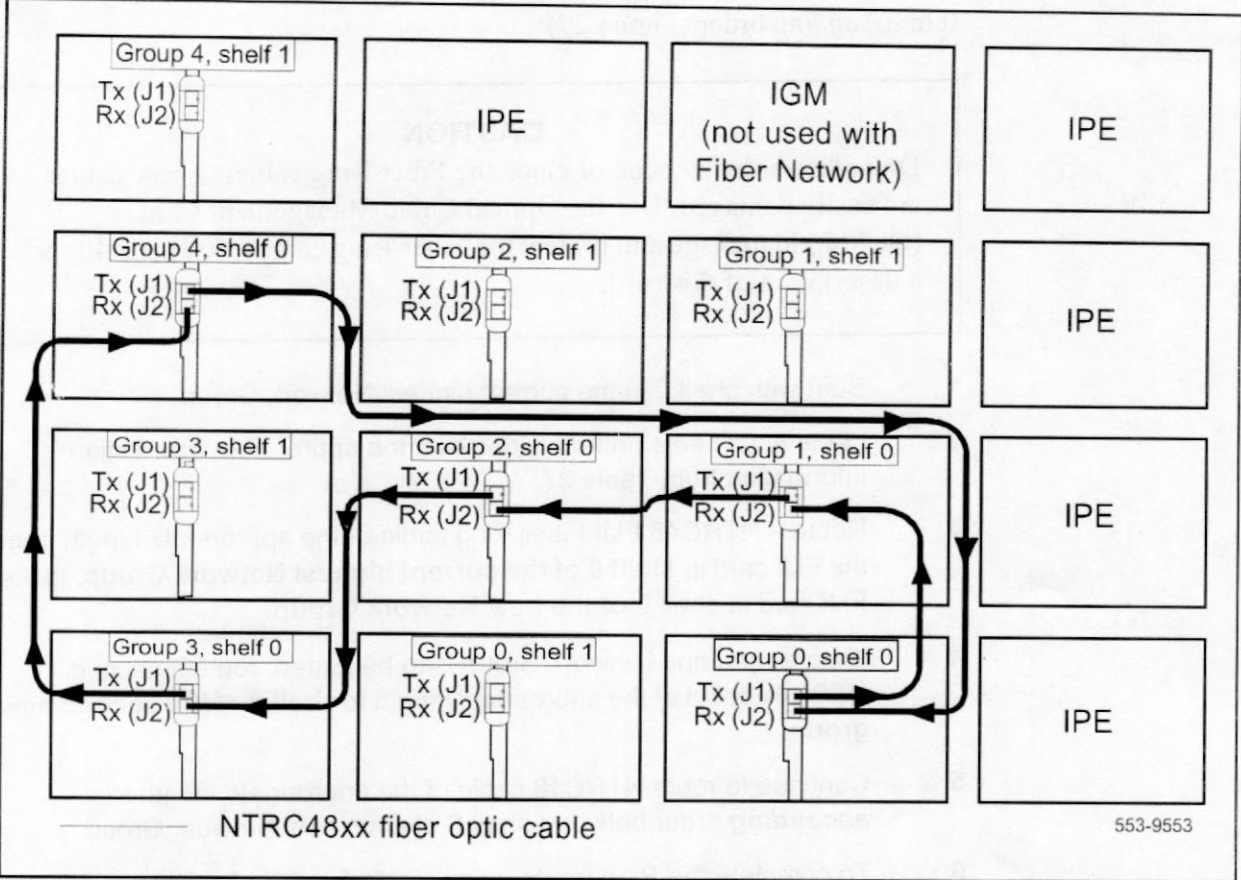


Table 27
FIJI Ring 0 connections

Groups X - 0 are cabled in ascending order		
Group/shelf	NTRC48 fiber cable connector	FIJI card connector
0/0	P1	Tx - J1
1/0	P2	Rx - J2
1/0	P1	Tx - J1
2/0	P2	Rx - J2
2/0	P1	Tx - J1
3/0	P2	Rx - J2
3/0	P1	Tx - J1
4/0	P2	Rx - J2
4/0	P1	Tx - J1
5/0	P2	Rx - J2
5/0	P1	Tx - J1
6/0	P2	Rx - J2
6/0	P1	Tx - J1
7/0	P2	Rx - J2
7/0	P1	Tx - J1
0/0	P2	Rx - J2

Label and route the shelf 1 fiber optic cables (descending)

Route the NTRC48 cables between the FIJI cards in each Network shelf 1 in *descending* order (Figure 28).

CAUTION

Do not excessively bend or cinch the Fiber Ring cables. These cables are easily damaged. Use the Optical Cable Management Card (OCMC) to manage and protect the Fiber Ring cables. See page 40 for a description of this card.

Note: Each end of the NTRC48 cable is labeled “Tx” or Rx” in the factory.

- 1 Start with Group 0, shelf 1.
- 2 Label each cable on both sides with the appropriate connection information from Table 28.
- 3 Route a NTRC48 FIJI Fiber Ring cable of the appropriate length from **shelf 1** of the FIJI card in **Group 0**, to the FIJI card in the **new highest Network Group, shelf 1**.
- 4 Route a NTRC48 cable from the FIJI card in the **new highest Network Group, shelf 1** to the FIJI card in the **second highest Network Group, shelf 1**.
- 5 Continue to route NTRC48 FIJI Fiber Ring cables of the appropriate lengths between shelf 1 of each new Network Group. Route these cables in **descending** order of Network Groups.
- 6 Route a final cable to the current highest Network Group, shelf 1.

Figure 28
Shelf 1 descending fiber optic Ring (example)

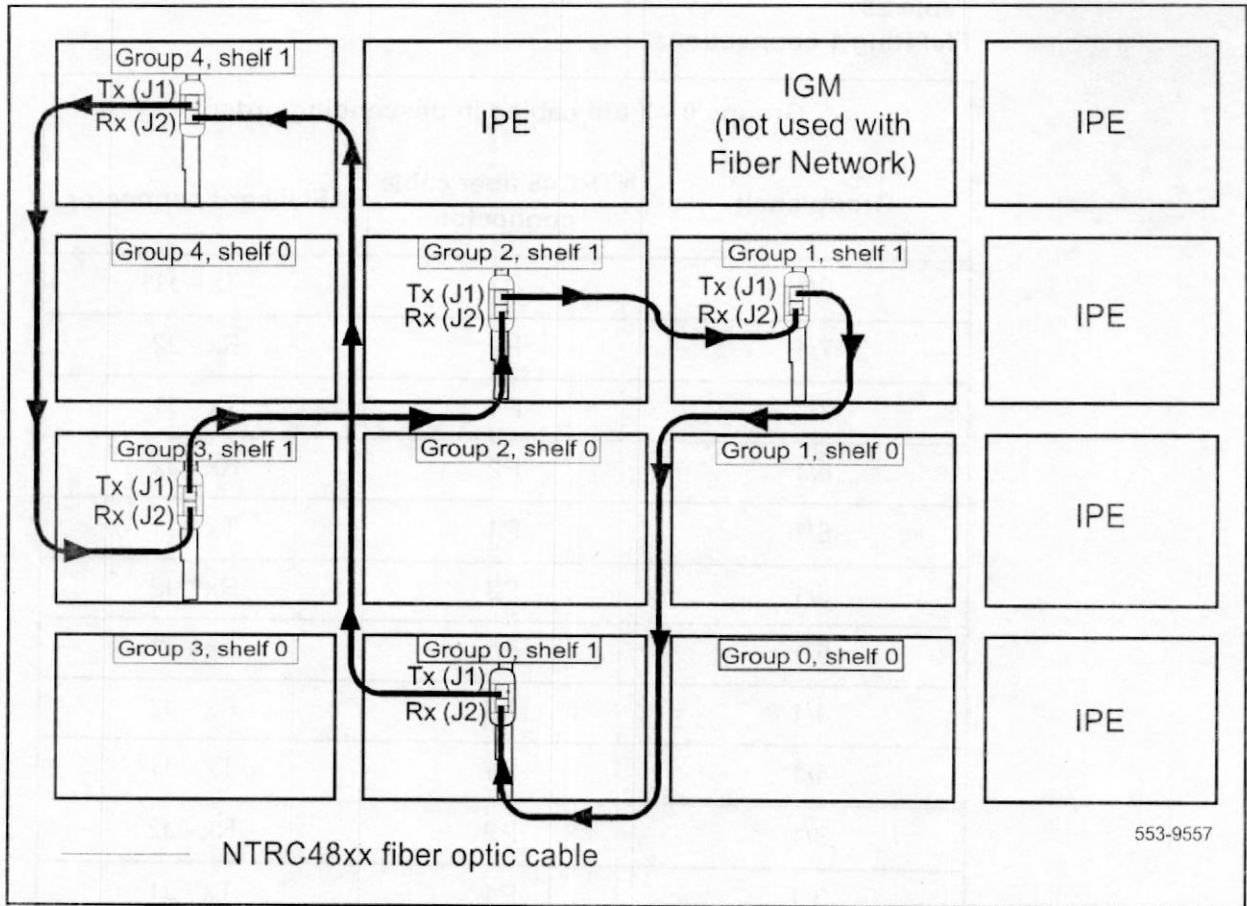


Table 28
FIJI Ring 1 connections

Groups 0 - X are cabled in descending order		
Group/shelf	NTRC48 fiber cable connector	FIJI card connector
0/1	P1	Tx - J1
7/1	P2	Rx - J2
7/1	P1	Tx - J1
6/1	P2	Rx - J2
6/1	P1	Tx - J1
5/1	P2	Rx - J2
5/1	P1	Tx - J1
4/1	P2	Rx - J2
4/1	P1	Tx - J1
3/1	P2	Rx - J2
3/1	P1	Tx - J1
2/1	P2	Rx - J2
2/1	P1	Tx - J1
1/1	P2	Rx - J2
1/1	P1	Tx - J1
0/1	P2	Rx - J2

Install cards in the Network modules

Network cards must be installed in the new Network modules as described below. Each card must be installed and enabled or disabled as indicated.

- 1 "Install and enable the 3PE cards" (below).
- 2 "Install and enable the Peripheral Signaling (Per Sig) cards" on page 193.
- 3 "Disable and insert the FIJI cards" on page 193.
- 4 "Disable and insert the Conf/TDS cards, if necessary" on page 193.

Install and enable the 3PE cards

Three steps are required to install the 3PE cards:

- 1 Verify the 3PE card settings:

The group and shelf number of each Network module is determined by the switch settings on the 3PE card. Use the information in Table 29 to verify that the 3PE cards in the new Network modules have the correct switch and jumper settings.

This group and shelf setting is displayed on the FIJI card display.
- 2 Install a 3PE card in slot 1 of each new Network module. Push the latches forward to lock the card in place.
- 3 Attach the cables to the *inactive* 3PE faceplates.
- 4 Faceplate *enable* each 3PE card.

Table 29

Switch and jumper settings for 3PE cards in NT8D35 Network modules

Jumper Settings									
Set Jumper RN27 at E35 to "A".									
Switch Settings									
D20 switch position:		1	2	3	4				
81, 81C (Note)		off	on	on	on				
Shelf	Group	D20 switch position:				5	6	7	8
0 (3PE cards connected to the a CNI in Core or Core/Net 0)	0					on	on	on	on
	1					on	on	off	on
	2					on	off	on	on
	3					on	off	off	on
	4					off	on	on	on
	5					off	on	off	on
	6					off	off	on	on
	7					off	off	off	on
1 (3PE cards connected to the a CNI in Core or Core/Net 1)	0					on	on	on	off
	1					on	on	off	off
	2					on	off	on	off
	3					on	off	off	off
	4					off	on	on	off
	5					off	on	off	off
	6					off	off	on	off
	7					off	off	off	off
Note: For option 81C systems, QPC441 vintage F or later must be used in all modules.									

Install and enable the Peripheral Signaling (Per Sig) cards

- 1 Install a Per Sig card into slot 4 of each new Network module. Push the latches forward to lock the card in place.
- 2 Faceplate *enable* the cards.

Disable and insert the FIJI cards

- 1 Faceplate *disable* the FIJI cards.
- 2 Insert the FIJI cards into slots 2 and 3 of each new Network module.

DO NOT plug the card into the backplane.

Disable and insert the Conf/TDS cards, if necessary

If Conf/TDS cards are used in the system, follow the procedures below.

- 1 Faceplate *disable* the Conf/TDS cards.
- 2 Insert a Conf/TDS card into each new Network module.

DO NOT plug the card into the backplane.

Enable the CNI cards

Note: If you are adding more than one Network Group, it is recommended that you add one group at a time in software. Follow all the remaining procedures in this chapter to complete the addition of one group before starting to add another group.

If new CNI-3 cards are required, they must be installed before the cards are enabled. See “Add CNI cards if necessary” on page 180 to install the cards.

Note: CNI cards can be enabled and connected on the *inactive* Core only.

Follow these procedures to connect and activate the new CNI ports:

- 1 Verify that the cables are correctly routed, labeled, and connected to the 3PE cards. See "Pre-route CNI to 3PE cables" on page 181.
- 2 Attach the cables to the *inactive* CNI cards.

See Table 25, "Option 81 CNI group assignments," on page 182 and Table 26, "Option 81C CNI group assignments," on page 183 for connection information.

WARNING

The backplane connector pins are easily bent. Install backplane cables with extreme caution to ensure that these pins are not damaged.

- Carefully line up the cable and press it into place.
- Never force a cable into the slot. If the cable gets stuck, remove it and try again. Damage to the backplane connector pins can make installation of CNI cables impossible.

- 3 Software enable the *new* CNI ports on the *inactive* Core:

LD 135 to load the program.
ENL CNI c s p (*core slot port*) to enable the card and ports.
- 4 Switch active Cores:

SCPU to switch Cores
- 5 Repeat steps 1 through 5 to attach the CNI to 3PE cables on the second Core side. Make sure that the second Core is now *inactive*.

Enable the FIJI cards

The FIJI cards are placed but not inserted and connected in slots 2 and 3 of each new Network shelf. Follow the procedures below to enable the cards:

- 1 Verify that the faceplate switch on each new FIJI card is *disabled*.
- 2 Plug the FIJI cards into the Network module backplane. Push the latches forward to lock the card in place.

- 3 Enable the faceplate switch.

Note: The card will not enable until a loop in that Network shelf is defined as described below.

- 4 Wait for the FIJI LED panel to display the Network Group and shelf of the card. This information is based on the 3PE switch settings. Verify that this information matches the printed label on the outside of the module case.

Note 1: The time required for the FIJI cards to display group and shelf information will vary.

Note 2: For 3PE switch settings, see "Install and enable the 3PE cards" on page 191.

- 5 Define the loops in the new group:

For example:

LD 17	to load the program
REQ	CHG
TYPE	CEQU
....	
XCT	xxx (enter the new loop)
	xxx
....	

- 6 Enable the new loops.

LD 34	to load the program
ENLX	to enable the newly defined loop
****	to exit the program

- 7 Wait for the FIJI card to enable. The time to enable will vary.

Connect the new groups to the Fiber Network

WARNING

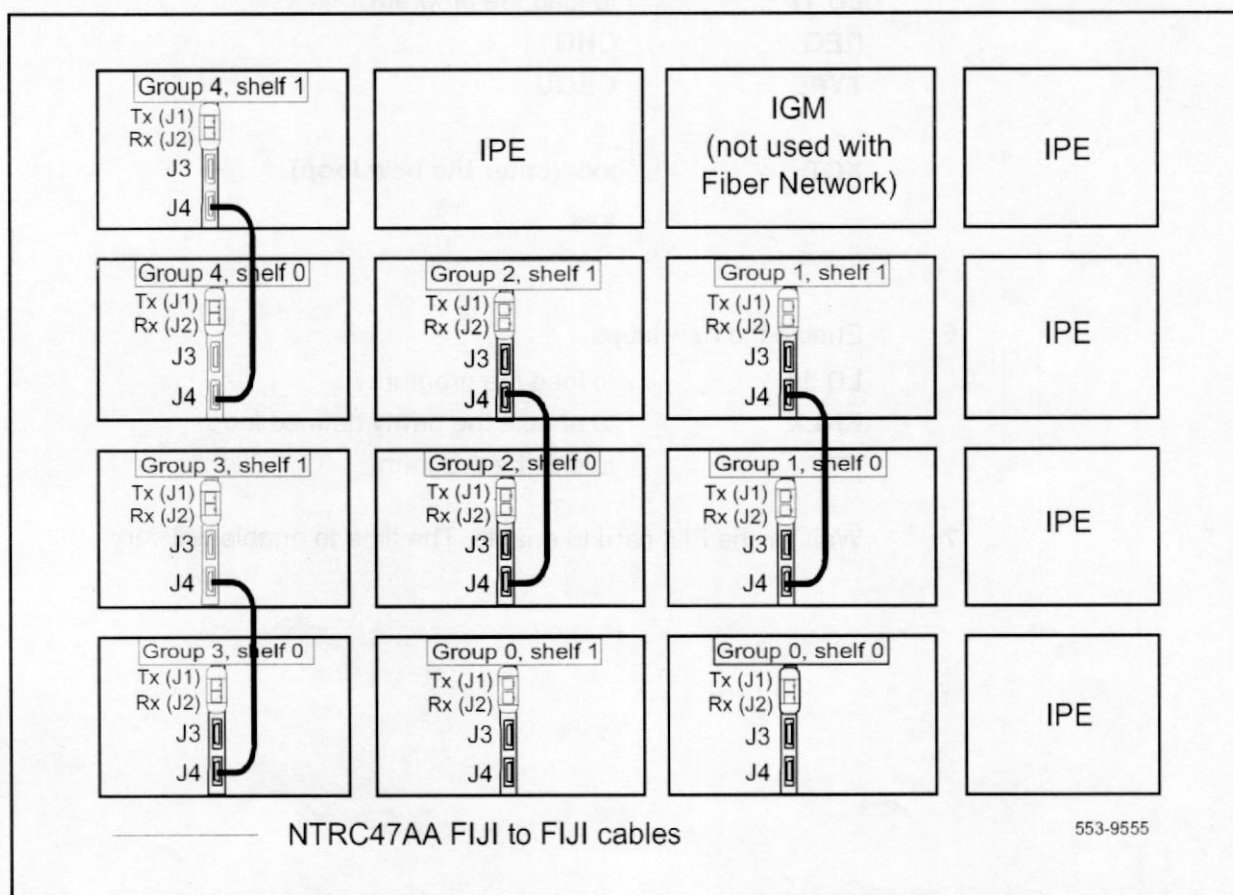
The Fiber Network Rings must be in Normal mode to complete this procedure. Resolve any faults and restore the Rings to Normal mode before Network Groups are added.

See “Appendix A: Fiber Network Fabric Application Notes” on page 207 for additional information on FIJI cards.

- 1 In each new Network Group, connect a NTRC47AA cable from J4 to J4 of the FIJI cards (see Figure 29).

Figure 29

FIJI shelf 0 to FIJI shelf 1 connections (Option 81C example)



- 2 Stat the Rings.
 LD 39 to load the program
 STAT RING 0 Ring state should be NORMAL STATE
 STAT RING 1 Ring state should be NORMAL STATE

 to exit the program
- 3 Verify that Clock 1 is *active*. Switch clocks if necessary.
 LD 60 to load the program
 SSCK 0 to check if Clock 0 is active or standby
 SWCK to switch clocks if necessary

 to exit the program
- 4 Verify that all cables are labeled and in place. Failure to pre-route cables will result in increased downtime and possible system failure. See "Pre-route the FIJI cables" on page 184 if the cables are not already routed.
- 5 Break Ring 0 by removing the cable from the current highest Network Group P1 to Group P2. The Rings will switch to SURVIVAL STATE once the Ring is broken.
- 6 Attach the new Ring 0 cables in the correct configuration.
- 7 Make Clock 0 active.
 LD 60 to load the program
 SSCK 0 to check if Clock 1 is active or standby
 SWCK to switch to clock 0

 to exit the program
- 8 Break Ring 1 by removing the cable from Group 0 P1 to the current highest Network Group P2.
- 9 Attach the new Shelf 1 Fiber Ring cables in the correct configuration.

- 10 Verify that the Rings are in Survival State and FIJI cards are enabled:

LD 39 to load the program
STAT RING 0 to check the status of Ring 0
STAT RING 1 to check the status of Ring 1

Note: The readout will specify the state of the Rings and which FIJI cards are enabled or disabled.

- 11 Reset the Rings:

LD 39 to load the program
RSET to reset the Rings
RSTR to restore the Rings

- 12 Check that the Rings operate correctly:

LD 39 to load the program
STAT RING 0 to check the status of Ring 0
STAT RING 1 to check the status of Ring 1

Note 1: Each Ring should now be in one of three States: None, Full or Half. The Rings should NOT be in Survival state.

Note 2: All FIJI cards should be enabled.

- 13 Enable the Per Sig card:

LD 32 to load the program
ENPS x (slot) to enable the Peripheral Signalling card
******** to exit the program

For example:

ENPS 12 to enable slot 12 (Group 6)
ENPS 13 to enable slot 13 (Group 6)

See Table 25, "Option 81 CNI group assignments," on page 182 or Table 26, "Option 81C CNI group assignments," on page 183 for slot and Group assignments.